Digital manufacturing and design technology

Department assigned to the subject: Department of Mechanical Engineering
Coordinating teacher: CASTEJON SISAMON, CRISTINA
Type: Compulsory  ECTS Credits : 3.0
Year : 1 Semester : 1

STUDENTS ARE EXPECTED TO HAVE COMPLETED
Basic training in industrial engineering: knowledge of technical drawing, and basic concepts of mechanical engineering

COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.

BASIC COMPETENCES

CB7 That students know how to apply the knowledge acquired and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.

CB8 That students are able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments.

CB9 That students know how to communicate their conclusions and the knowledge and ultimate reasons that sustain them to specialized and non-specialized audiences in a clear and unambiguous way.

GENERAL COMPETENCES

CG1 Knowledge and understanding of the theoretical foundations of both industrial processes and services, and communications.
CG2 Ability to model, identify basic requirements and analyze various processes.
CG4 Knowledge and understanding of the management principles applicable to productive and service environments.
CG6 Capacity to adapt to changes in requirements associated with new products, new specifications and environments.

SPECIFIC COMPETENCES

CE1 Ability to design automatic process systems (production machinery, transport and storage systems and quality control) and the interconnection between their different modules (industrial protocols).
CE7 Ability to apply the communication of devices, both among them and globally, in the environment of Connected Industry 4.0.
CE9 Ability to identify computer security requirements in connected industry environments.
CE10 Programmatic data processing capabilities in solving particular problems of the connected industry.
CE11 Ability to design customizable and adaptable mechanical parts and objects.

LEARNING RESULT
After completing this subject matter, the student will be able to:
- Analyze the new digital production systems under the model of IC4.0 and the study of demand.
- Know the new technologies of digital product production: additive production, rapid prototyping, total quality control, etc.
- Design new flexible production systems of low and medium complexity that are capable of producing on demand.
- Manage the production of a medium-sized system and manage the supply.
DESCRIPTION OF CONTENTS: PROGRAMME

2. Digitization in the complete life cycle of a product
3. Modeling and mechanical design oriented to the digitization of production
4. Real-time 3D modeling and simulation
5. Design technologies applied to additive production and rapid prototyping
6. Design and customization of new components and mechanical systems
7. Product quality control systems
8. Industrial Maintenance 4.0

LEARNING ACTIVITIES AND METHODOLOGY

TEACHING ACTIVITIES REGARDING TO THE SUBJECT:
AF1 Theoretical class
AF2 Practical class
AF4 Laboratory class
AF5 Tutorials
AF6 Group work
AF7 Student individual work
AF8 Exams

Activity Code Nº Total Hours Nº Classroom Hours % Classroom /Student
F1 16,5 16,5 100
AF2 4,5 16,5 100
AF4 1,5 1,5 100
AF5 2 2 100
AF6 25 0 0
AF7 25 0 0
AF8 1,5 1,5 100

total 76 26 33%

ASSESSMENT SYSTEM

The assessment system is:
- Individual or group work (SE2): 60%
- Final exam (SE3): 40%

% end-of-term-examination: 60
% of continuous assessment (assigments, laboratory, practicals...): 40

BASIC BIBLIOGRAPHY


ADDITIONAL BIBLIOGRAPHY